

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (Canceled)

2. (Currently Amended) A method of use of a catalyst,
catalyst for hydrocarbon steam cracking, which comprises a supported KMgPO₄ catalyst,
wherein the KMgPO₄ supported catalyst is obtained by supporting KMgPO₄ on a carrier
wherein the catalyst is a KMgPO₄ catalyst supported on a carrier;
wherein the catalyst is obtained by sintering KMgPO₄ and the carrier under 1,000-1,400
°C for 22-26 hours; and
wherein the concentration of KMgPO₄ in the catalyst is in a range of 0.5-30 wt% based
on the total weight of the catalyst;
for hydrocarbon steam cracking.

3. (Currently Amended) The method catalyst of claim 2, wherein the carrier is selected from the group consisting of alpha-alumina, silica, silica-alumina, zirconium oxide, magnesium oxide, magnesium aluminate, calcium aluminate, and zeolite.

4-5. (Canceled)

6. (Currently Amended) A method for preparing a catalyst for hydrocarbon steam cracking, which comprises:
dissolving a KMgPO₄ precursor in water to prepare an aqueous solution of the KMgPO₄ precursor; [[and]]
impregnating a carrier with the aqueous solution of the KMgPO₄ precursor to prepare a supported catalyst; and

sintering the supported catalyst under 1,000-1,400 °C for 22-26 hours.

7-8. (Canceled)

9. (Original) The method of claim 6, wherein the KMgPO_4 precursor is prepared from magnesium nitrate hydrate, potassium hydroxide, and ammonium phosphate.

10. (Original) The method of claim 6, wherein the carrier is selected from the group consisting of alpha-alumina, silica, silica-alumina, zirconium oxide, magnesium oxide, magnesium aluminate, calcium aluminate, and zeolite.

11. (Currently Amended) A method of use of a catalyst,
catalyst for hydrocarbon steam cracking,
wherein the catalyst which comprises is a sintered KMgPO_4 catalyst[[,]];
wherein the ~~KMgPO_4 -sintered~~ catalyst is obtained by sintering a KMgPO_4 powder or a KMgPO_4 precursor powder and a metal oxide under 1,000-1,400 °C for 22-26 hours; and
wherein the concentration of KMgPO_4 in the catalyst is in a range of 0.5-50 wt% based
on the total weight of the catalyst;
for hydrocarbon steam cracking.

12. (Canceled)

13. (Currently Amended) The method of catalyst of claim 11, wherein the metal oxide is selected from the group consisting of alpha-alumina, silica, silica-alumina, zirconium oxide, magnesium oxide, magnesium aluminate, calcium aluminate, and zeolite.

14. (Canceled)

15. (Currently Amended) A method for preparing a catalyst for hydrocarbon steam cracking, which comprises:
mixing a KMgPO_4 powder or a KMgPO_4 precursor powder and metal oxide; and

sintering the resultant mixture under 1,000-1,400 °C for 22-26 hours to obtain a sintered catalyst of KMgPO_4 -metal oxide.

16. (Canceled)

17. (Original) The method of claim 15, wherein the metal oxide is selected from the group consisting of alpha-alumina, silica, silica-alumina, zirconium oxide, magnesium oxide, magnesium aluminate, calcium aluminate, and zeolite.

18. (Canceled)

19. (Currently Amended) The method of claim [[18]] 22, wherein the steam cracking is carried out at a reaction temperature of 600-1,000°C, a weight ratio of steam/hydrocarbons of 0.3-1.0, and LHSV (Liquid Hourly Space Velocity) of 1-20 hr^{-1} .

20. (Currently Amended) The method of claim [[18]] 22, wherein the steam cracking is carried out in a reactor selected from the group consisting of a fixed-bed reactor, a fluidized-bed reactor, and a mobile phase reactor.

21. (Currently Amended) The method of claim [[18]] 22, wherein the catalyst is regenerated by removal of cokes formed on a surface of the catalyst at 500-1,300°C in the presence of air, steam, or a mixture thereof after the steam cracking.

22. (New) A method for producing olefins by steam cracking of hydrocarbons, wherein the method comprising;
providing hydrocarbons for steam cracking;
contacting the hydrocarbons with a catalyst,
wherein the catalyst is KMgPO_4 catalyst supported on a carrier,
wherein the catalyst is obtained by sintering KMgPO_4 and the carrier under 1,000-1,400 °C for 22-26 hours, and

wherein the concentration of KMgPO_4 in the catalyst is in a range of 0.5-30 wt% based on the total weight of the catalyst; and
obtaining olefins,
wherein the olefins include ethylene having a range of 31.2 to 31.6%, propylene having a range of 17.1 to 17.2%, and cokes formed on a surface of the catalyst having a range of 0.62 to 3.37%.

23. (New) A method for producing olefins by steam cracking of hydrocarbons, wherein the method comprising;
providing hydrocarbons for steam cracking;
contacting the hydrocarbons with a catalyst;
wherein the catalyst is KMgPO_4 catalyst,
wherein the catalyst is obtained by sintering a KMgPO_4 powder or a KMgPO_4 precursor powder and a metal oxide under 1,000-1,400 °C for 22-26 hours, and
wherein the concentration of KMgPO_4 in the catalyst is in a range of 0.5-50 wt% based on the total weight of the catalyst; and
obtaining olefins,
wherein the olefins include ethylene having a range of 31.2 to 31.6%, propylene having a range of 17.1 to 17.2%, and cokes formed on a surface of the catalyst having a range of 0.62 to 3.37%.

24. (New) The method of claim 23, wherein the steam cracking is carried out at a reaction temperature of 600-1,000°C, a weight ratio of steam/hydrocarbons of 0.3-1.0, and LHSV (Liquid Hourly Space Velocity) of 1-20 hr^{-1} .

25. (New) The method of claim 23, wherein the steam cracking is carried out in a reactor selected from the group consisting of a fixed-bed reactor, a fluidized-bed reactor, and a mobile phase reactor.

26. (New) The method of claim 23, wherein the catalyst is regenerated by removal of

cokes formed on a surface of the catalyst at 500-1,300°C in the presence of air, steam, or a mixture thereof after the steam cracking.